NEWS RELEASE

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
400 MARYLAND AVENUE, SW, WASHINGTON 25, D.C.
TELEPHONES: WORTH 2-4155 —— WORTH 3-1110

FOR RELEASE: UPON DELIVERY - Expected about 8 P.M., May 7, 1962

B10

Address by
James E. Webb, Administrator
National Aeronautics and Space Administration
at the
Inaugural Dinner for Mayor Schiro
New Orleans, Louisiana
May 7, 1962

Gentlemen:

It is a privilege to be here in New Orleans this evening. The United States space program is an activity of vital importance to the nation and the world. It has growing economic and cultural significance to New Orleans and the surrounding area.

I should like to give you a general view of this space program with special emphasis on the nature and purpose of the launch vehicles involved in it, and then to describe in some detail what you may expect from your new NASA neighbors -- the Michoud plant for fabrication and assembly of large launch vehicles, and the nearby Facility in Mississippi, at which they will be tested.

Before discussing what we are doing today, and what we plan to achieve in the future, I believe it would be illuminating to consider how we got where we are. What changes in attitudes made a government-sponsored space program possible? What new considerations made it not only desirable and necessary but, in fact, essential to our nation?

Let us consider first the change in public attitude which has led our citizens to adopt new scientific ideas and concepts which most of us would have regarded with skepticism only a few years ago: Ideas which, in fact, had they been advanced in the era of 17th Century Salem might have caused their advocates to be burned at the stake.

Then let us consider how and why, in the context of this new public acceptance and support for accelerated scientific research, the federal government has come to occupy so major a role in scientific research and development -- an area in which only a few years ago private efforts were primary.

We live in a period of extremely rapid scientific and technological advancement. We are part of a generation which is highly receptive to new thoughts, new methods and new ideas. To be visionary is no longer to be impractical. And it is increasingly true that innovations and inventions require the kind of highly educated mind that understands the total complexities of nature's forces; has far more than a peripheral or superficial foundation of knowledge.

It is not always thus. In 1800, farmers resisted using the cast iron plow because they feared that it would poison the ground. Edison almost buried the airplane, just after Kitty Hawk, with his comment that it could never have any practical value and would, at best, be "nothing more than the toy of wealthy sportsmen."

Even in a more recent field, rocketry, which concerns us here tonight, pioneers in the first half of our century encountered great skepticism and resistance. Dr. Robert H. Goddard, the father of this new science, found scant acceptance for his work that proved the rocket engine could deliver its power in a vacuum.

In those early days rockets became to many a symbol of impractical ideas and grandoise schemes. Goddard and other rocket advocates inherited the mantle of ridicule worn by the airplane pioneers.

Today, these attitudes have been altered by necessity, and by lessons learned in two military conflicts of the past half-century -- by dramatic demonstrations of science as having political, social, and economic as well as military force. Hostility to change has diminished, and along with it some of the eternal conflict between the old and the new, the stand-patter and the innovator, the past and the future.

Science and technology have earned a new place in society and what was "good enough for grandfather" is no longer good enough for us.

Thus, while it took almost 50 years to move from the Wright Brothers' fragile airplane to one which could fly faster than sound, little more than a decade was required to move from 700 miles an hour to 4,000. Meanwhile, man-made objects were hurled beyond the atmosphere into orbit around the earth at 17,000 miles an hour, and by 1959, out into the solar system at 25,000 miles an hour.

Today, only four years after the first man-made satellite, we are able to launch spacecraft large enough to carry men in orbit around the earth, and the idea of reaching the moon has moved from fictional legend to scientific fact.

Along with this public willingness to accept change, and its recognition of science and technology as the keystones of a new era of human progress, has also come an awareness that the rate of progress which our circumstances demand can only be achieved by expanding and marshalling the resources of the nation in a coordinated, large-scale effort. The facilities, skills, resources, and funds required, are not within the capacity of any single, or even group of private institutions to provide. Only a coordinated effort of federal agencies, working with the nation's industries, educational institutions, and public purpose foundations, is adequate to meet the challenge.

This is not a situation which came overnight, but rather one which has evolved over more than 175 years of national experience. We have progressed from the nation's first tentative venture into scientific exploration -- the Lewis and Clark Expedition, in which the Congress invested $2,500 in 1803 -- to a federal participation in scientific research and development estimated to exceed $12 billion in 1963.

Much of this growth in federal activity, and in the recognition of science and technology as vital forces in our national life, has been dictated by military necessity. It developed to a limited extent during the Civil War, which gave the nation's scientists a chance to establish an institution of which they had been dreaming for decades, the National Academy of Sciences.

Again, at the beginning of World War I, our military and civilian leaders were forced to a heightened appreciation of the importance of aeronautical science, which led to the creation of the National Advisory Committee for Aeronautics, in 1915.

But the great upsurge in scientific and technological development, and government participation in it, came with World War II, which produced a new awareness and concept of the changing role of science in national and world affairs. With the first awesome demonstration of the destructive force of the atom bomb -- a result of the highly secret government scientific effort in the Manhattan project -- science and technology could no longer be denied as a vital force of our century.

There followed quickly the creation of the Atomic Energy Commission, the National Science Foundation, and, with the ominous beeps of the first Soviet Sputnik sounding in our ears, the National Aeronautics and Space Administration.

All of these developments occurred in recognition of the fact that the major scientific advances necessary to our national safety and progress require group efforts, expensive equipment, and massive technological support, often over many years of sustained effort. Only government can marshall the resources to organize and finance such endeavors. Private enterprise stands ready to undertake contracts for much of this work, and to take up feasible and saleable applications as they can be identified, but many of the pioneering opportunities now opening up on the frontiers of science require such large investments that they must first be developed to meet governmental requirements if they are to be made available for the benefit of mankind.

With these circumstances requiring new and decisive uses for science and technology, with public attitudes which led to quick acceptance, and with requirements in terms of time and accomplishment which forced government to assume a larger role, let us look at what happened in our national space program.

With the enactment of the National Aeronautics and Space Act of 1958, a long-range plan for civilian space exploration and development was laid out by the Eisenhower Administration. The plan provided, over a 10-year period, for the development of scientific satellites, application satellites in such areas as weather and communications, lunar and planetary exploration and manned space flight.

Although the plan called for space development which, in ordinary circumstances, would have been regarded as rapid and ambitious, it could not have achieved manned lunar exploration before the mid-1970's, and there was, in fact, doubt that anything beyond the earth-orbital experiments of the Mercury program would ever be required.

This was the situation in early 1961, when the Soviet Union began a series of demonstrations that convinced all but the most confirmed skeptics of its rapid progress in space and its clear intention to use space accomplishment to establish a world-wide image of leadership in space science and technology.

Recognizing that a nation so great and powerful as ours must either use its capacity for leadership or lose it, President Kennedy responded promptly to the Soviet challenge, and urged that it was "time to act" to restore American leadership in this vital new field of endeavor. He called for an accelerated program which would place an American exploratory team on the moon "within this decade."

To overcome Soviet leadership in rocket power, the President requested that Congress accelerate our program for the development and production of large launch vehicles, large rocket engines, multi-manned spacecraft, and other projects designed to hasten the day when man would reach the moon.

The President made his recommendations in a completely non-partisan spirit, and Congress accepted them on the same basis. To both, the lessons of Russian successes in space and in their propaganda use throughout the world, were clear.

As a consequence of these actions, we today have a National Launch Vehicle Program which recognizes all of the requirements of our nation in space, and includes the vehicles to fulfill them.

We have gone through a difficult period when we tried many types and variations of rockets. Now, however, we are in a position to select those which show the greatest efficiency and reliability, and we can work to make them more and more reliable.

In the National Launch Vehicle Program, the two smallest rockets, and the four most powerful ones, have been, or are being, developed by NASA. The four of intermediate size are adaptations of Air Force missile carriers, Thor, Atlas, and Titan.

Briefly, let me list these 10 launch vehicles in order of ascending size. Many of these names are already familiar to most of you:

<u>Scout</u> is a four-stage rocket, using solid propellants in all stages, that can place a satellite of 150 pounds in earth orbit. Scout will also see much use as a sounding rocket in our space sciences program.

Delta has two liquid-fuel stages and a solid-fuel stage on top. It can boost 500 pounds into orbit around the earth, and has established a fine record for reliability. Delta launched our first Orbiting Solar Observatory in March, and the four TIROS weather satellites, and will orbit the experimental communications satellites Relay and Telstar. With a small stage added, Delta will be employed next year to orbit the first Syncom communications satellites, which will go into orbit at 22,300 miles and will seem to hover motionless in the sky because they will be moving at the same speed as the earth is turning.

Third in line is the Thor-Agena B whose liquid-fuel stages can boost a sixteen hundred pound satellite into an earth orbit. It has been used to launch the many Air Force Discoverer satellites, the ones which eject capsules that in many instances have been caught on the fly or recovered from the Pacific.

NASA will employ Thor-Agena B in coming months to launch the big balloon satellite, Echo II, which is 135 feet in diameter when inflated. This "satelloon" will be brighter in the evening sky and should hold its shape much longer than Echo I, which was 100 feet in diameter and which can still be seen with the unaided eye, although not as brightly as in 1960, when most of you probably watched it sparkle like a moving star.

Fourth in line is the familiar -- and now very dependable -- Atlas, a one-stage, liquid-fuel booster which fires the 2,700-pound Mercury spacecraft into orbit.

Fifth in line is our most powerful rocket in current use, the Atlas-Agena B, which can lift 5,000 pounds in earth orbit. We believe that this launch vehicle can send instrumented payloads of up to 750 pounds to the moon. Atlas-Agena B is being used currently for Ranger missions. It will also send the unmanned Mariner spacecraft toward Venus this summer, under a plan to pass within 25,000 miles or better of that planet, and will launch Nimbus, an advanced weather satellite, following our TIROS series. Nimbus will be a decided improvement over TIROS because it will keep its camera pointed at the earth continuously rather than part of the time.

The Atlas-Agena B will also be used to launch our Orbiting Astronomical Observatory, which will take a 36-inch telescope 500 miles above the obscuring turbulence of the atmosphere, and OGO, the Orbiting Geophysical Observatory, which will carry as many as 50 scientific experiments at a time. These versatile new scientific satellites will be ready for launch in 1963 or 1964.

The Agena B, which is used as the upper stage with Thor and Atlas, is worthy of special mention in its own right. It is our leading "space engine" at present because of its multiple start capability.

For example, when launching Ranger to the moon, the Agena B and attached spacecraft go into parking orbit around the earth. Then, at the proper time, the Agena B is re-started and as it gathers speed heads off on the calculated trajectory for the moon. As I previously mentioned, we were especially pleased with the Ranger shot that hit the moon because of the accurate and predictable performance of Agena B.

When we begin rendezvous experiments next year or early in 1964, the Agena B will be fired as the target for the Gemini spacecraft to overtake in space. After the two are coupled, the Agena B will become the spacecraft's engine for further maneuvers.

Vehicle No. 6 in our National Launch Vehicle Program is also a very promising one. It is the <u>Titan II</u>, which is just coming into use as a military booster. Titan II has a new type of liquid fuel which does not "boil" away, but can be kept stored in the rocket ready to go on short notice.

Titan II can lift more than 6,000 pounds into orbit, and will be used to launch Gemini, the two-man spacecraft.

<u>Centaur</u>, No. 7 on our list, is an important step forward in the space program because the upper stage burns liquid hydrogen instead of kerosene and will, therefore, deliver about twice the thrust of the Agena B upper stage. The familiar Atlas will still be used as the booster, or first stage.

We have had some delays with Centaur because of difficult problems connected with this pioneering use of liquid hydrogen. We need Centaur especially for Project Surveyor, which will soft-land instruments on the moon and orbit the moon, for flights past Mars and Venus with larger spacecraft in 1964 and 1966, and for Aeros, the most advanced weather satellite now under consideration, which is tentatively scheduled to be placed in synchronous orbit, 22,300 miles high, in 1965.

Our three largest vehicles are of particular interest to New Orleans, not merely because they exceed in thrust any others known to exist in the world, but because the Michoud and Mississippi test facilities will play a major role in their development.

No. 8 -- and a very lucky number for us so far -- is Saturn, which has been under development since 1958. I have reported the two successful flights of the first stage.

Saturn has a cluster of eight engines burning kerosene and liquid oxygen in the first stage and a cluster of six new-type engines burning liquid oxygen and hydrogen in the powerful second stage, which will have more than five times the thrust of Agena B, for example. We hope to flight-test the second stage for the first time next year.

Saturn will be used to put the Apollo spacecraft into earth orbit.

This is our first vehicle which will surpass the lifting power the Russians have demonstrated. Whether they are also working on something as big or bigger than Saturn we do not know, but we can suppose that they are.

No. 9 on our list is still a larger launch vehicle. Although called the Advanced Saturn, it will be a completely new vehicle with much more powerful engines than the present Saturn concept. Advanced Saturn has five engines in the first stage, and each of these five will produce the same thrust as all eight of the engines in the first stage of Saturn.

Advanced Saturn, when ready for operation four or five years from now, will be able to put 100 tons into earth orbit, and send more than 40 tons to the moon.

This is enough power for a flight around the moon, but not enough to launch the Apollo spacecraft, fully loaded and equipped, for a lunar landing and return to the earth. Two Advanced Saturns may be used for this purpose. One would orbit the spacecraft and the other would orbit its own third stage as engine to launch the spacecraft from earth orbit to the moon. The two would have to be joined in rendezvous while in orbit around the earth.

The tenth on our list is the giant of our rocket program -- the Nova. Nova is in the early development stages at the present time, but funds have been requested to begin all-out development during the next 12 months.

Nova will have sufficient thrust to launch 175 tons into an earth orbit, or 75 tons to the moon. It is designed to permit manned lunar landing by direct ascent if one of the various rendezvous techniques does not achieve this objective in a shorter period of time.

This, however, is neither the only, nor perhaps the most important, reason for building the Nova.

Beyond the first manned landing on the moon, there will most probably be a certain amount of traffic, the equivalent of freight, rather than passenger, traffic to be transported by the simplest and most economical means.

NASA analyses indicate that the use of Nova could well provide the most desirable means of transporting heavy payloads to the moon should this be required.

Beyond lunar exploration -- and it must be remembered that getting to the moon is not the end objective of our space program -- Nova appears to be of great value for unmanned and manned exploration of the near planets, Venus and Mars.

Finally, the most powerful vehicle toward which we can look confidently at the present time is one comprising Nova first and second stages, and a nuclear-powered upper stage. Development of nuclear-powered rocket engines, in cooperation with the Atomic Energy Commission, is already underway.

Let us turn now to the facilities which are required in the conduct of our space program, and more particularly, to those which will become most familiar to you in years to come -- the Michoud Plant and the Mississippi Test Facility.

In visualizing these facilities, it is well to have in mind the enormous size of the boosters which they will serve. The Advanced Saturn, for example, will be comprised of three stages totalling 270 feet in height, with a 33-foot diameter at the base. Its big brother, the Nova, will tower 280 feet into the air with a base diameter of 50 feet. In neither instance do these heights include that which will be added by attachment of spacecraft and lunar landing components. A Nova rocket, equipped for manned landing on the moon, could not lie full-length on the gridiron in the Sugar Bowl.

Essential elements of both vehicles will be fabricated by thousands of firms located throughout the 50 states. The Advanced Saturn, and possibly Nova, will be assembled at Michoud. Subsequently, the vehicles will receive their static testing at the Mississippi Test Facility, before being transported to Cape Canaveral for flight testing and ultimate lunar operations. These sites, together with that of the Manned Spacecraft Center at Houston, Texas, were all selected with the availability of water transportation in mind, since these very large vehicles cannot be satisfactorily transported by any other means.

The Michoud Plant, located 15 miles east of New Orleans adjoining the Gulf Intercoastal Waterway and the Michoud Canal, was selected after consideration of many other prospective locations. It met all criteria, including that of extensive high-bay manufacturing space already constructed.

Expenditures for modifications to the existing plant and new construction at Michoud of $18,400,000 have been proposed to the Congress for Fiscal Year 1963. Nearly 7,000 persons will be employed by the NASA contractors at this facility in that same fiscal year.

The Mississippi Test Facility, located about 35 miles northeast of New Orleans in Hancock and Pearl River counties, will include an area of about 13,500 acres of NASA-owned land, and a buffer zone of 128,000 additional acres upon which NASA will hold easements. We have proposed the expenditure of $92,500,000 for the construction of new facilities at this location during Fiscal Year 1963. When it becomes operative, the facility will employ between 500 and 1,000 engineers and support personnel.

I might add that all of us at NASA look forward to the closer association with the citizens of New Orleans, Louisiana and Mississippi, which most certainly will result from the establishment of these facilities. The work which will be performed there is of major significance in our Apollo program, and essential to the achievement of the national goal set by President Kennedy -- that of placing a United States exploratory team on the moon before 1970.

Now that we have crossed the threshold of space, the benefits that can be gained for all mankind, the assurances to our national security that can be obtained, and the stimulus to our well-being that can be produced, are looming large on the horizon.

The President has provided the leadership necessary to expand our efforts to meet our needs and responsibilities in space. The Congress, on a bipartisan basis, is providing the support that it requires. Scientists, engineers, technicians, and leaders in government, industry, education and other fields are cooperating wholeheartedly to attain our national goals. The American people themselves have responded with enthusiasm to the great adventure that lies before us.

In moving forward in this great undertaking, it is important to remember that while we have certain specific national objectives in mind, the overriding concept underlying this program is that of driving forward the advancing front of science and technology at the most rapid rate possible over the years ahead and making practical use of the results in space, and throughout our economy.

It is through these vast scientific undertakings that progress most rapidly comes. While striving toward the goals which we have already adopted, we shall almost certainly discover others of even more importance. The important thing now is to make sure we are not behind in any area vital to our national security or our national leadership.